

REC'D 29 JAN 2002
WIPO PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference JSR.P50909WO	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB00/04667	International filing date (day/month/year) 07/12/2000	Priority date (day/month/year) 08/12/1999

International Patent Classification (IPC) or national classification and IPC  
E21B47/022

Applicant DEN NORSKE STATS OLJESELSKAP A.S. et al.
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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I  Basis of the report
- II  Priority
- III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV  Lack of unity of invention
- V  Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI  Certain documents cited
- VII  Certain defects in the international application
- VIII  Certain observations on the international application

Date of submission of the demand 05/07/2001	Date of completion of this report 25.01.2002
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Str mmen, H Telephone No. +49 89 2399 7345



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**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, pages:**

1-23                    as originally filed

**Claims, No.:**

1-22                    as originally filed

**Drawings, sheets:**

1/6-6/6                as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description,                pages:
- the claims,                    Nos.:

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the drawings, sheets:

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c));  
*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims 1-22
	No: Claims
Inventive step (IS)	Yes: Claims 21
	No: Claims 1-20, 22
Industrial applicability (IA)	Yes: Claims 1-22
	No: Claims

**2. Citations and explanations  
see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

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Reference is made to the following documents:

D1: US-A-4 957 172

D2: WO 96 35859 A

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

V-1 D1, which is considered the closest prior art, discloses the subject-matter of claim 1 as follows (the references in parentheses applying to this document):

A method of estimating positional uncertainty in drilling a well (Abstract I. 7-9), comprising supplying a first set of values representing a first three-dimensional uncertainty of the actual position of a drill bit (claim 1, I. 12-13) with respect to the estimated position thereof (claim 1, I. 9-11), supplying a second set of values representing a second three-dimensional uncertainty of the actual position of a feature (claim 1, I. 7-8) with respect to the estimated position thereof (claim 1, I. 4-6), combining the first and second sets of values to form a third set of values (claim 1, I. 14-15) representing a third uncertainty of the position of the drill bit with respect to the feature (claim 1, I. 16-18), and calculating from the third uncertainty the probability that the drill bit reaches a predetermined position relative to the feature.

The apparatus according to claim 1, therefore differs with respect to D1 in that the "feature" is a geological feature.

The apparatus according to claim 1 is therefore new and the claim meets the novelty requirements of Article 33(2) PCT.

V-2 The problem to be solved by the present invention may therefore be regarded as how to find alternative applications for the claimed method.

To use the method also for geological features is described in D2 (page 24,

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last line to page 25, three first lines) as providing the same advantages as in the present application. The skilled person would therefore regard it as a normal design option to include this feature in the method of D1 in order to solve the problem posed.

The solution proposed in claim 1 of the present application can therefore not be considered as involving an inventive step (Article 33(3) PCT).

- V-3 Furthermore, D1 discloses the subject-matter of dependent claims 2-5 (see fig 1 and claim 4). Said claims do therefore not seem to involve an inventive step (Article 33(3) PCT).
- V-4 In view of D2, none of claims 6-19 and 22 seem to involve an inventive step (Article 33(3) PCT).
- V-5 Furthermore, D1 discloses the subject-matter of claim 21 as follows (the references in parentheses applying to this document):

A method of assessing the value of a well, comprising supplying details of a hydrocarbon reservoir, selecting an optimum point of intersection of a drill path with the reservoir (see D1).

The method according to claim 21, therefore differs with respect to D1 in:

Calculating the probabilities of the drill path intersecting the reservoir at a plurality of points using a method as claimed in any one of claims 1 to 20, calculating the probability distribution of the value of recoverable hydrocarbons for each of the points of intersection and deriving from the calculated probabilities and the probability distribution a distribution of the value of the well.

The apparatus according to claim 21 is therefore new and the claim meets the novelty requirements of Article 33(2) PCT.

- V-6 The problem to be solved by independent claim 21 may be regarded as how

to assess the value of a well. As none of the documents cited in the International Search Report are concerned with the assessment of the value of a well, but are rather directed towards the problem of well intersection, the solution to the problem proposed in claim 21 of the present application is considered as involving an inventive step (Article 33(3) PCT).

**Re Item VII**

**Certain defects in the international application**

- VII-1 The Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- VII-2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- VII-3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 and D2 is not mentioned in the description, nor are these documents identified therein.
- VII-4 As the subject-matter of claim 22, relate to the subject-matter of claims 14, the numbering of the claims does not meet the requirement of Rule 6.4(c) PCT.

**Re Item VIII**

**Certain observations on the international application**

- VIII-1 To satisfy the conciseness requirement of Article 6 PCT, the present set of claims should include only the minimum necessary number of independent claims in any one category. Said requirement is not satisfied by independent claims 1 and 21, as in the present case, it is considered appropriate to use only one independent claim in any one category.